EPA dismisses significance of health study involving metals, Butte infants

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Dr. Charles Partridge, a toxicologist with the Environmental Protection Agency, addresses a recent Butte-Silver Bow Health Department meeting.
Meagan Thompson, The Montana Standard

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In blunt terms, the Environmental Protection Agency on Wednesday dismissed the significance of a recent study of metals content in the meconium of Butte infants, saying the results of the study, termed "shocking"

by the researchers, simply show metals levels consistent with existing scientific literature.

"If you look at the ranges (of metals) found in the literature — all the metals, copper, zinc, manganese — the conclusion is obvious," Charles Partridge, EPA Region 8 toxicologist, said Wednesday. "We have this body of literature. One study is all the way against everything that's been published that we've been able to find. Everything's pointing one way and this study's pointing the other."

For example, the study, by scientists Suzanne McDermott and Jamie Lead of the University of South Carolina and Katie Hailer, an associate professor of chemistry at Montana Technological University, shows a median amount of copper in the samples as 26.3 parts per million with a range of 11.06 to 47.27. A 2019 study in eastern Canada found a median of 67.8 and a range of 15-250. For manganese, the Butte study found a median of 5.364 and a range of 3.88 to 18.120. The Canadian study found a median of 14.31 and a range of 1-100. For zinc, the Butte study found a median of 81.642 and a range of 22.120 to 312.695. The Canadian study found a median of 313.8 and a range of 20-1500.

The metals levels published in the McDermott-Lead-Hailer study for a control group in South Carolina seem extraordinarily low, Partridge said — in many cases 1,000 times lower than levels found in other studies, giving rise to questions about the accuracy of the South Carolina numbers.

"Good science stands up under scrutiny," Partridge said Wednesday. "We're not looking any more or any less at this study than we would at our own results, or any other study. We're doing what good scientists do, what we're required to do."

Nikia Greene, remediation project manager for the Butte hill, said Wednesday, "My goal and objective is to make sure the cleanup is protective of human health and the environment. I think what you see today is the EPA team doing our due diligence."

"It's not just me and Nikia," Partridge said. "It's numerous scientists, statisticians, toxicologists and engineers from other federal agencies, state and local health agencies" who have the same view of the study and its relationship to the body of literature on the subject.

Partridge said he has asked the researchers for any "splits," or parts of the studied material, that remain plus the data sets produced by the testing laboratories in Montana and South Carolina.

He said Hailer has already provided some materials and he is confident the rest of what he asked for will be received shortly.

But he is not waiting to examine the data and retest the meconium to say, "Our job is to make sure this is not a public health emergency. Our initial review suggests it is not."

McDermott of the University of South Carolina, one of the three researchers who did the study, said Wednesday, "I can say quite confidently that we made no mistakes in this study." She added, "It is possible the EPA's interpretation of some of the tables in the published literature is wrong, and thus the comparisons that lead them to believe the Butte levels are not elevated is also wrong."

Regarding the South Carolina test results, McDermott insisted, "There is absolutely no reason to think they should have higher metal levels ... than the ones we observed."

Later Wednesday, Hailer issued a response to the EPA's comments. *(See related story).*

Partridge and Greene, along with the Agency for Toxic Substances and Disease Registry, a branch of the Centers for Disease Control, discussed the study and their findings this week at a meeting of the "Health Study Working Group," a group with representatives from many local agencies. EPA requires Atlantic Richfield and Butte-Silver Bow to produce a Butte health study every 5 years as a part of the cleanup. A new report is being worked on now.

"What we've tried to do with the working group," Greene said, "is include community members and experts." He said Hailer has been invited to join the working group, and has attended several meetings.

The group's meetings "are not private," Greene said, but they're not exactly public either. They are not publicly noticed.

"They're technical meetings," Greene said. But EPA Region 8 spokesperson Andrew Mutter said, "We will do everything we can do to be more transparent in that effort."

Editor's note: *Katie Hailer, associate professor of chemistry at Montana Technological University, issued this response Wednesday evening to the Environmental Protection Agency's comments about the pilot study she co-authored examining metals content in the meconium of Butte infants.*

"What we can say about our meconium study is that the Butte numbers are much greater than the South Carolina numbers. Our numbers are correct and there were not errors in the methods, analysis or presentation of these numbers. It is a very small study with no extra information about mothers, residence, length in Butte, etc. etc. I think we have clearly communicated the limitations to the study.

"We have limited literature to go upon to compare our pilot study to other published works. In most cases, but not all, authors of other papers are collecting data within an "exposed" population vs. a more "non-exposed" population. This would give a range of data from non-detect all the way up to larger values for a variety of metals. It is very possible that Butte's numbers fall into the category of 'normal for an exposed community.'

"In addition, none of these studies have taken place in the U.S. so we are comparing our values to other countries and in some cases the methodologies of the other studies seem different enough from ours that it might be unwise to compare the data sets (I don't mean the analysis by ICP-MS. I mean the digestion step. One paper mentioned using a teflon bomb digester. Another paper assessed dry weight which will give very different numbers than wet weight samples-ours are wet weight).

"We won't know any more about Butte's values until a larger, much more comprehensive study is undertaken.

"If the EPA and others want to take our very small study and compare it across the board to larger studies without accounting for variations in methodologies or sample collection from exposed or non-exposed groups, and say they are confident the Butte numbers fall in the "normal" range, then that is their decision. I find that conclusion tenuous, especially since our highest values are for Cu, Mn, and Zn, three metals that the EPA has never studied in the context of human health in Butte.

Obviously those 3 metals are especially hard to assess regarding human health since they are trace micronutrients, but that doesn't mean we should discount them out of hand. There is plenty of literature to suggest that these metals can have unwanted, toxic effects in chronically high levels.

"Again our comparison was Butte vs South Carolina and in that context, the values are very different from one another and they are different enough that it is concerning and more study should be undertaken to ensure that we are doing enough in Butte, in the context of cleanup, to protect human health."